FUSE, ALARM AND DISTRIBUTION PANEL (FADP), 628490

GENERAL DESCRIPTION

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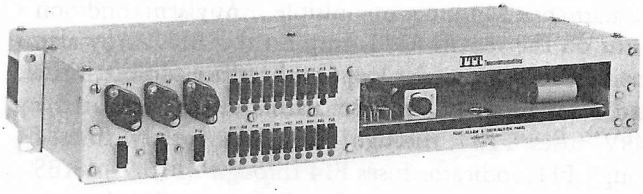
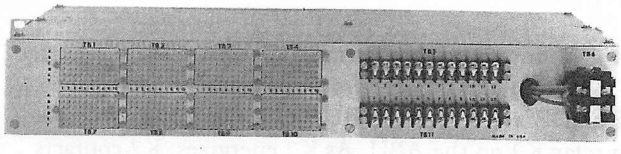
1. GENERAL

1.01 This Section provides a general description of the ITT D448 fuse, alarm and distribution panel (FADP), 628490 (Fig. 1), to the simplified schematic diagram level.



FRONT VIEW



REAR VIEW

Fig. 1—FADP, 628490

1.02 This Section has been reissued to add reference to the 20-Hz fuse installation kit; reduce the rating of fuses F1, F2, and F3; and to update Fig. 2.

1.03 When equipped with the alarm and ballast unit (ABU), 628494 or 628496, the FADP performs the following functions:

(a) Distributes – 48V battery, – 48V talk battery, and – 48V alarm battery supply (– 48 ABS) to up to eight D448 multiplex terminals. Two spare – 48V fuse positions are also available for use as required;

(b) Distributes protected 20-Hz negative superimposed ringing to up to eight D448 multiplex terminals, on a per-digroup basis (if required);

(c) Monitors the battery and ringing distribution circuits for fuse alarm conditions, and provides connections for fuse alarm and terminal alarm multiples;

(d) Provides termination tie points for connecting the high frequency (HF) transmit and receive pairs between the multiplex terminals and the span termination equipment. HF signals from up to eight multiplex terminals can be connected at these tie points; and

(e) Provides termination tie points for connecting audible, visual, electronic switching system (ESS), and E2 alarm signals from each of the multiplex terminals to the office.

2. DESCRIPTION

2.01 The FADP mounts in a 23-inch wide relay rack, either as part of an ITT prewired bay (600174-800, 600175-800, or 600176-800) or as an addition in a customer-configured bay. Installation procedures for the unit are provided in Section ITTR-18-490.

2.02 The FADP is available in Group -0 only. Each ABU is also available in Group -0 only.

2.03 Cartridge-type fuses, F1 through F3, and GMT-type fuses, F4 through F26, are mounted on the front panel of the FADP. The current rating of each GMT-type fuse is identified by a color dot located at the bottom of each fuseholder (Table A). A mounting space for the ABU is provided in the front panel of the FADP.

Note: A 20-Hz ringing fuse installation kit (supplied with FADP) is provided to allow field selection of the rating of fuse F13. Refer to Para. 3.10 prior to fuse selection.

2.04 Terminal blocks TB1 through TB11 are mounted on the rear panel of the FADP. Terminal blocks TB1 through TB4 and TB7 through TB10 consist of six rows of wire-wrap pins; each row containing ten pins. The rows are designated A through F from top to bottom; the pins are numbered 1 through 10 from left to right. Terminal blocks TB5 and TB11 consist of 12 screw terminals; the screw terminals are numbered 1 through 12 from left to right. Terminal block TB6 consists of four screw terminals, the right-side screw terminals are numbered 1 and 2 from top to bottom, the left-side screw terminals are numbered 3 and 4 from top to bottom.

2.05 The ABU, 628494 or 628496, is a plug-in printed circuit board (PCB) which provides mounting space and associated printed wiring for the alarm circuit components, red ALARM indicator, and ringing ballast thermistors. When the unit is installed in the FADP, the alarm indicator appears as part of the front panel display. Printed circuit wiring is etched on both sides of the PCB. These contacts mate with a 44-contact edge connector, J1, located on the connector bracket within the FADP.

TABLE A

GMT-TYPE FUSE CURRENT RATING COLOR CODES

FUSE RATING	COLOR CODE
0.18A	Yellow
1A	Gray
1-1/3A	White
3A	Blue
5A	Green
7-1/2A	Black/White

3. FUNCTIONAL OPERATION (FIG. 2)

–48V BATTERY, TALK BATTERY, AND –48 ABS DISTRIBUTION (FIG. 2, SHEET 1)

3.01 The FADP receives –48V battery from the office power board or equivalent source via TB6-1 and/or TB6-3. This voltage is fused through two 15A main fuses to provide the separate fused distribution lines supplying the multiplex terminals through terminal board TB11. Main fuse F1 supplies fuses F17 through F21 (terminals TB11-1 through TB11-5, respectively); and main fuse F2 supplies fuses F22 through F26 (terminals TB11-6 through TB11-10, respectively). Terminals TB11-1 through TB11-8 supply battery to multiplex terminals 1 through 8, respectively; while TB11-9 and TB11-10 provide two spare –48V outputs for use within the bay. Frame ground is connected to terminal TB11-11. Terminal TB11-12 is not used.

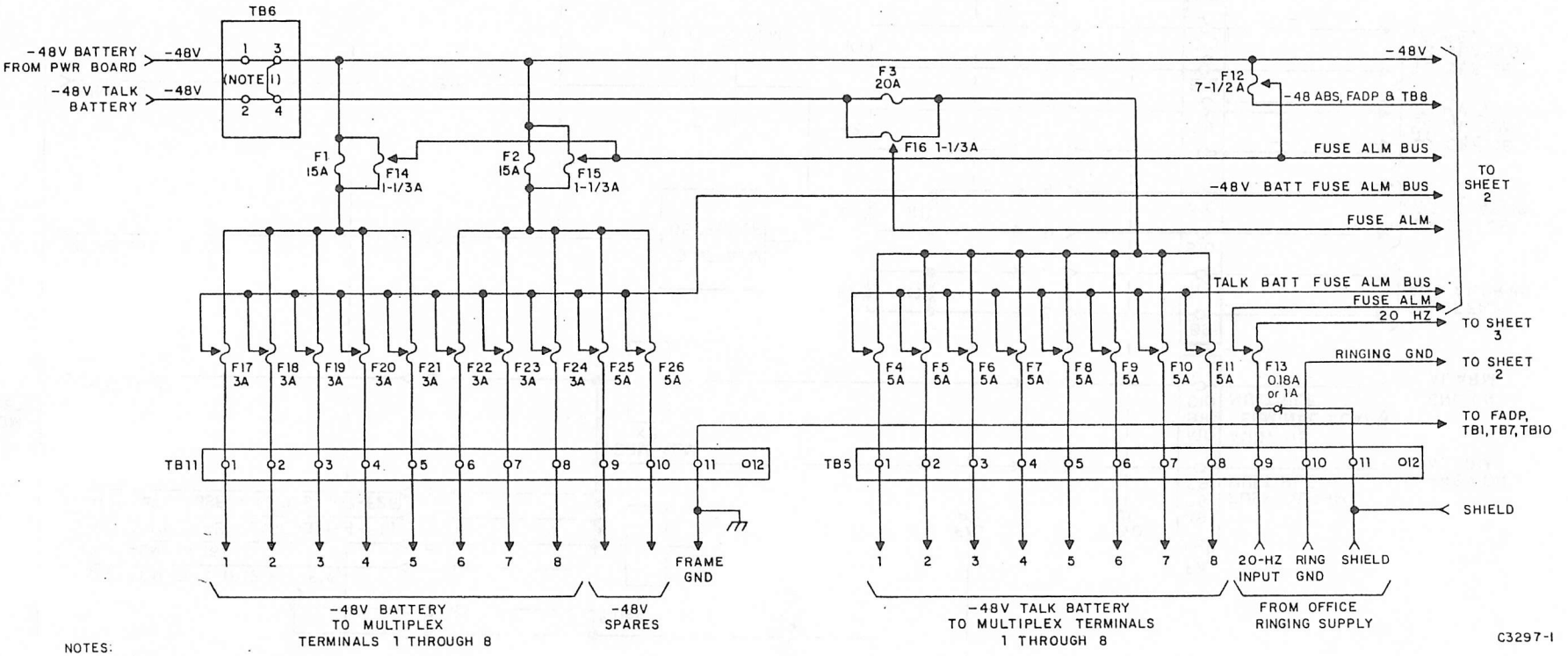
3.02 The FADP is supplied with a metal strap between terminals TB6-3 and TB6-4 on the rear of the panel. By leaving this strap in, talk battery is supplied by the same source that supplies –48V battery to the FADP. Filters in the D448 system power supply unit (PSU) will adequately filter noise levels on the –48V input up to 40 dBrnC. If the –48V power source exceeds this noise level, separate filtered talk battery should be used. If a separate talk battery supply is to be used, the strap must be removed by loosening the screws at TB6-3 and TB6-4. After removal of the strap, these screws should be retightened, and the talk battery supply connected to terminals TB6-2 and/or TB6-4. Main fuse F3 (20A) provides fused talk battery to fuses F4 through F11. These fuses are connected via distribution lines to terminals TB5-1 through TB5-8 on the rear of the FADP, for distribution to multiplex terminals 1 through 8, respectively.

3.03 The –48 ABS line is taken from the –48V battery line in the FADP and fused through F12 (7-1/2A). It is available on the rear of the FADP at terminal block TB8, terminals E10 and F10.

ALARM CIRCUITS (FIG. 2, SHEET 2)

3.04 The alarm circuits monitor fuse alarms in the FADP and any alarms connected to either the bay fuse alarm or audible alarm multiple. Any alarm condition turns on the red ALARM lamp on the ABU. Any alarm condition also closes dry loops to the office audible, visual, and E2 alarms. FADP fuse alarms can be initiated by –48V fuses F17 through F26, talk battery fuses F4 through F11, indicator fuses F14 through F16, –48 ABS fuse F12, and 20-Hz ringing fuse F13. Fuses F14 through F16 provide alarms for the failure of main fuses F1 through F3, respectively.

3.05 When a multiplex terminal alarm occurs, a carrier group alarm (CGA) ground signal is forwarded to the FADP via TB8-A10, B10, or C10, energizing bank alarm relay K2 on the ABU. As K2 energizes, K2 contacts turn on the ALARM indicator. Other K2 contacts present a dry loop closure to the office and E2 alarms.



NOTES:
1. REMOVE STRAP BETWEEN TB6-3 AND TB6-4 IF SEPARATE POWER FEEDS ARE DESIRED FOR -48V BATTERY AND -48V TALK BATTERY. (SEPARATE TALK BATTERY IS NECESSARY ONLY IF NOISE LEVEL OF -48V C.O. POWER EXCEEDS 40 dBrnC).

Fig. 2—FADP, 628490, Simplified Schematic Diagram (Sheet 1 of 3)

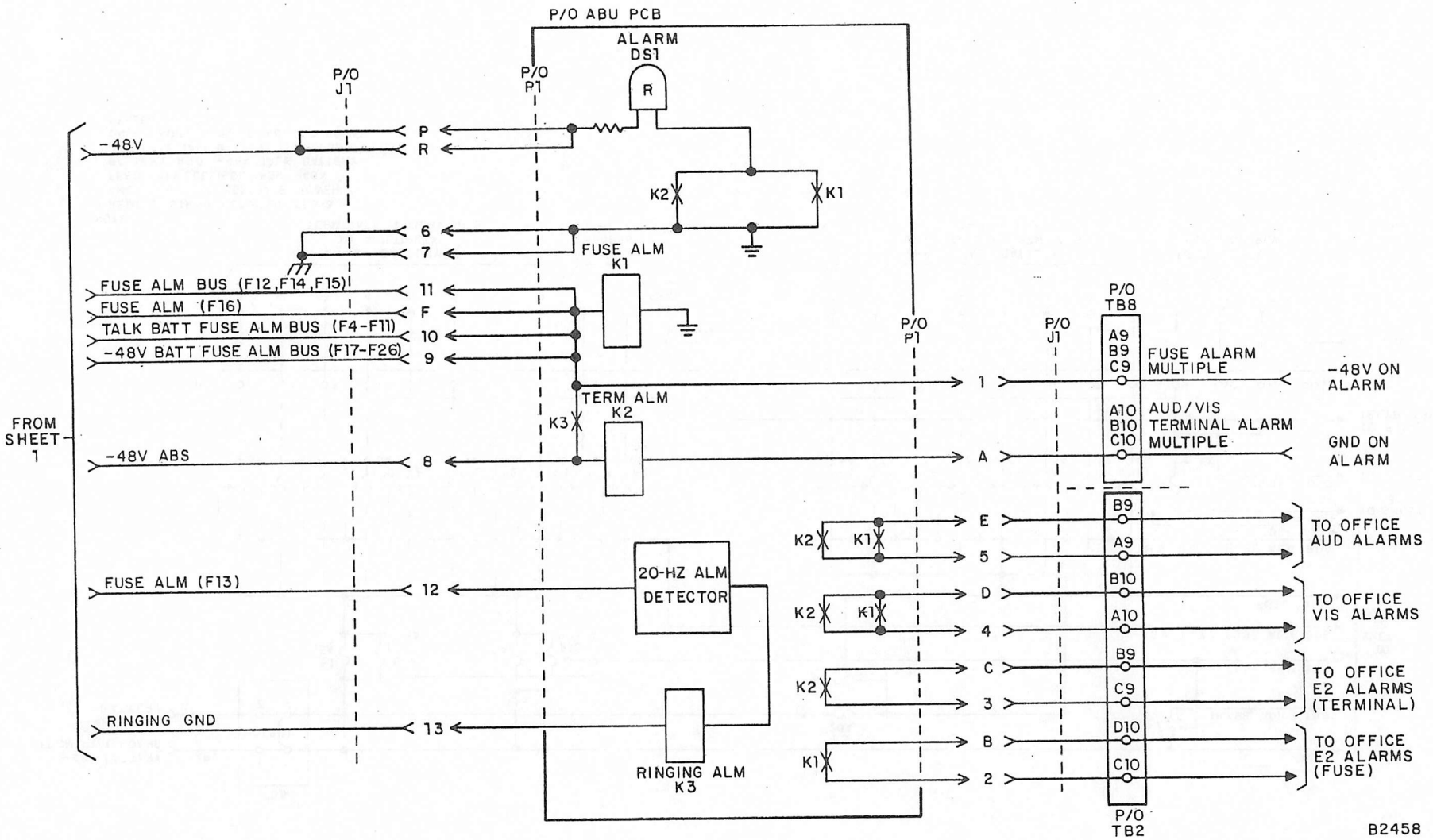
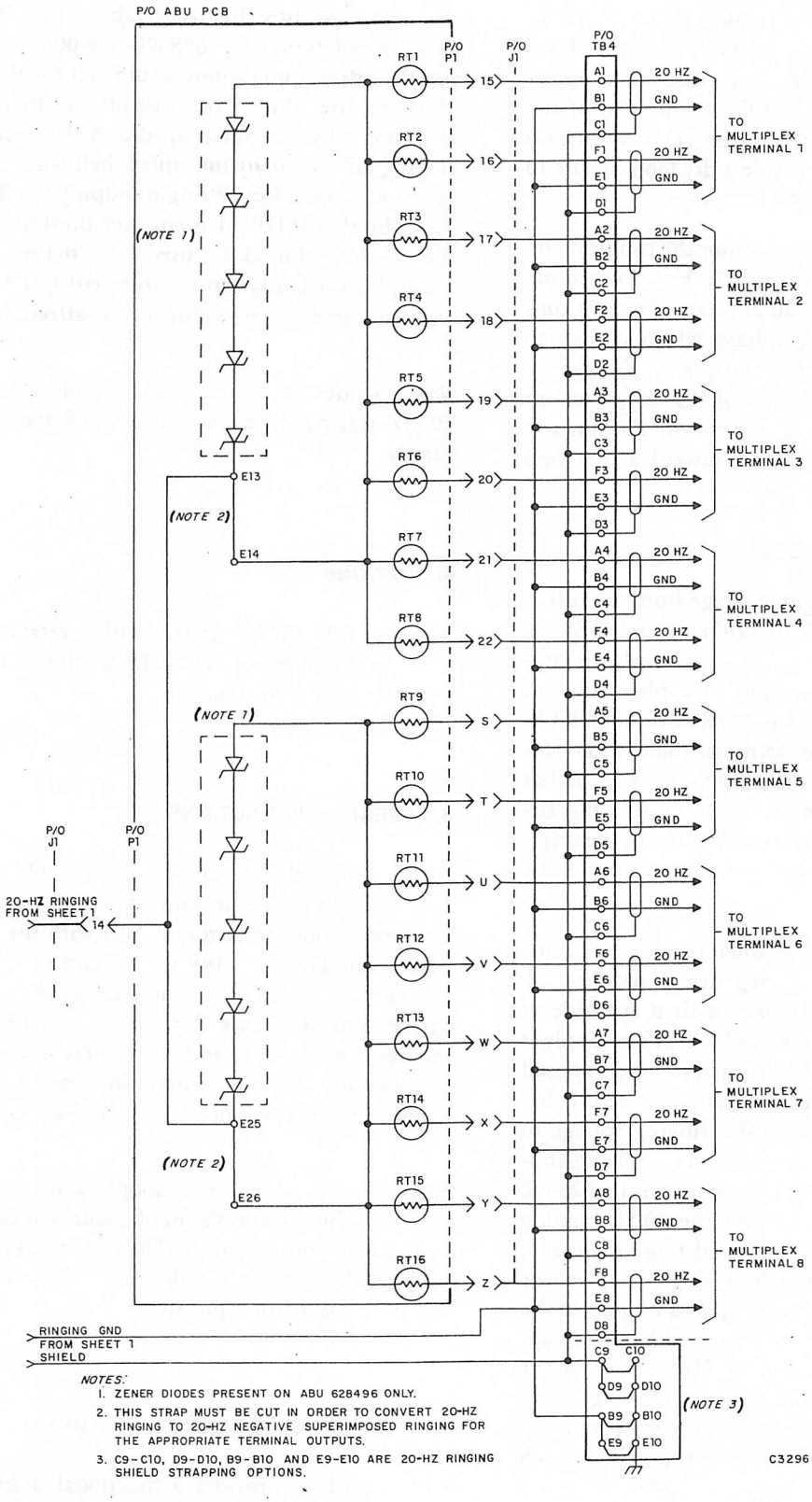


Fig. 2—FADP, 628490, Simplified Schematic Diagram
(Sheet 2 of 3)



NOTES:
1. ZENER DIODES PRESENT ON ABU 628496 ONLY.
2. THIS STRAP MUST BE CUT IN ORDER TO CONVERT 20-HZ RINGING TO 20-HZ NEGATIVE SUPERIMPOSED RINGING FOR THE APPROPRIATE TERMINAL OUTPUTS.
3. C9-C10, D9-D10, B9-B10 AND E9-E10 ARE 20-HZ RINGING SHIELD STRAPPING OPTIONS.

Fig. 2—FADP, 628490, Simplified Schematic Diagram (Sheet 3 of 3)

3.06 The fuse alarm relay K1 monitors all FADP fuses directly except the 20-Hz ringing fuse F13. K1 is energized by −48V when one or more of these fuses opens, or when −48V is present on the fuse alarm multiple, connected to TB8-A9, B9, or C9 on the rear of the FADP. When K1 energizes, its contacts close to turn on the ALARM indicator and to provide a dry loop closure to the office audible and visual, and E2 alarms.

3.07 The ringing alarm circuits monitor the condition of 20-Hz fuse F13. If F13 opens, 20 Hz is placed on the 20-Hz fuse alarm bus. The 20-Hz alarm detector converts the 20-Hz signal to a dc voltage which is used to energize ringing alarm relay K3. Energizing K3 applies −48 ABS voltage through contacts of K3 to fuse alarm relay K1, energizing K1. As K1 energizes, K1 contacts turn on the ALARM indicator and forward a dry loop closure to the office and E2 alarms.

RINGING CIRCUITS (FIG. 2, SHEET 3)

3.08 The FADP receives ringing voltage from the office ringing supply via TB5-9 (20 Hz) and TB5-10 (ringing ground). The shield from the input cable is connected to TB5-11. The ringing signal is applied through 20-Hz fuse F13 and a ballast thermistor RT1 through RT16 for the various digroups, to terminal block TB4 for distribution to multiplex terminals 1 through 8. A ballast thermistor is provided in each of the 16 distribution circuits (one per digroup) to prevent overloading of the office ringing supply if a short circuit develops in any of the output circuits.

3.09 The ABU, 628494, is used when the office ringing supply provides 20-Hz negative superimposed voltage. This type of ringing voltage is then available at the rear of the FADP. When the available office supply is 20-Hz ringing voltage, and 20-Hz negative superimposed ringing is also required, the ABU, 628496, is used. It has zener diodes which can convert 20-Hz ringing voltage to 20-Hz negative superimposed ringing voltage for distribution to the multiplex terminals. Two straps on the 628496 unit must be cut in order to convert the 20-Hz ringing voltage to 20-Hz negative superimposed ringing voltage, for up to eight multiplex terminals. A single strap can be cut to supply 20-Hz negative superimposed ringing to the block of four multiplex terminals controlled by that strap, leaving the other strap to supply 20-Hz ringing to the other four-multiplex terminal block. Cutting strap E13-E14 supplies 20-Hz negative superimposed ringing to the multiplex terminals connected to TB4, pins 1 through 4. Cutting strap E25-E26 supplies 20-Hz negative superimposed ringing to the multiplex terminals connected to TB4, pins 5 through 8.

3.10 The 20-Hz ringing fuse F13 can be either a 0.18A or 1A fuse (field-selectable from 20-Hz ringing fuse installation kit, 628490-018-001, supplied with FADP). Most applications would call for the 0.18A fuse. However, use of the 0.18A fuse inhibits thermistor protection normally provided by the ABU. Consequently, a ringing failure in any multiplex shelf will open the 0.18A fuse and cause a loss of ringing supply to all other shelves fused by the FADP. If thermistor protection is required, the 1A fuse should be used. A ringing failure in any multiplex shelf digroup is protected by a thermistor and will result in a ringing failure of the affected digroup only.

Note: Under no circumstances should the rating of the 20-Hz ringing fuse exceed that of the office ringing supply.

4. OPTIONS

4.01 The FADP is provided with several circuit options. Refer to Section ITTR-18-490 for detailed information on option selection.

5. SPECIAL RESTRICTIONS

5.01 Although the wiring of the FADP is capable of up to 90A, the maximum input current rating as equipped from the factory is 50A with the strap between TB6-3 and TB6-4 (−48V supply and talk battery inputs) on the rear of the panel. The total of *all* fuses used in the FADP must not exceed this value. When the strap is removed, with −48V and talk battery supplied separately, the maximum input current ratings are 50A for the −48V supply and 20A for the −48V talk battery.

5.02 To avoid ground loops and attendant noise problems, the shield of a shielded cable should be connected at one end only. The choice of which shield end to leave "floating" should be made according to local company installation practices.

6. TEST AND MAINTENANCE FEATURES

6.01 Table B provides a functional description of the FADP test and maintenance features. Fig. 1 shows the physical location of each test and maintenance feature.

TABLE B

TEST AND MAINTENANCE FEATURES, FUNCTIONAL DESCRIPTION

FEATURE	REF. DES.	FUNCTION
15A Cartridge-Type Fuse	F1	Controls distribution of −48V input battery via fuses F17 through F21 to multiplex terminals 1 through 5.
15A Cartridge-Type Fuse	F2	Controls distribution of −48V input battery via fuses F22 through F26 to multiplex terminals 6 through 8 and two −48V spares.
20A Cartridge-Type Fuse	F3	Controls distribution of talk battery via fuses F4 through F11 to multiplex terminals 1 through 8.
GMT-Type Fuses	F4 through F11	Control distribution of talk battery to multiplex terminals 1 through 8.
GMT-Type Fuse	F12	Controls distribution of −48 ABS throughout the bay.
GMT-Type Fuse	F13	Controls distribution of 20-Hz protected ringing to multiplex terminals.
GMT-Type Fuses	F14 through F16	Indicate when main fuses F1 through F3, respectively, open.
GMT-Type Fuses	F17 through F24	Control distribution of −48V battery to multiplex terminals 1 through 8.
GMT-Type Fuses	F25 and F26	Control distribution of spare −48V outputs for use as needed.
ALARM Lamp	DS1	Turns on when any fuse alarm condition exists.

7. TECHNICAL SUMMARY

7.01 A summary of technical specifications for the FADP is given in Table C.

TABLE C

TECHNICAL SUMMARY

ITEM	SPECIFICATION
DC POWER	
Input	
Voltage	−42.5 to −56.0 Vdc
Current	50A, maximum (total of all inputs)
Output	
Voltage	−42.5 to −56.0 ±0.5 Vdc
Current	Up to 3A at TB11-1 through TB11-8 and up to 5A at TB11-9 and TB11-10 and TB5-1 through TB5-8, depending on fusing and load conditions
RINGING VOLTAGE	
Input	80 to 160 Vrms (w/628494 ABU); 130 to 160 Vrms (w/628496 ABU)
Output	80 to 160 Vrms ±5% (w/628494 ABU); 98 to 128 Vrms ±5% (w/628496 ABU); Superimposed on −37 to −39 Vdc ±5%
OPERATING ENVIRONMENT	
Temperature	0° to 55°C
Humidity	To 95% at 40°C (no condensation)
Altitude	To 14,000 ft (4,300 m)
DIMENSIONS	
FADP	
Width	21.3 in. (54.1 cm)
Height	3.5 in. (8.9 cm)
Depth	11.5 in. (29.2 cm)
ABU	
Width	10.1 in. (25.7 cm)
Height	1.1 in. (2.8 cm)
Depth	5.6 in. (14.2 cm)
WEIGHT	
FADP	6.0 lb (2.7 kg) includes ABU
ABU	0.6 lb (0.3 kg)

8. REPLACEABLE PARTS

8.01 Field-replaceable parts for the FADP are listed in Table D.

TABLE D

REPLACEABLE PARTS

DESCRIPTION	QTY	ITT PART NO.
Lamp, Incandescent, Bayonet, 14V, 02.A	1	600025-390-001
Fuse, GMT, 3A (F17 through F24)	8	600031-396-001
Fuse, GMT, 1A (F13)	1	600031-396-005
Fuse, GMT, 1-1/3A (F14 through F16)	3	600031-396-006
Fuse, GMT, 5A (F4 through F11, F25, F26)	10	600031-396-008
Fuse, GMT, 7-1/2A (F12)	1	600031-396-009
Fuse, GMT, 0.18A (F13)	1	600031-396-011
Fuse, Cartridge, 15A (F1, F2)	2	600053-396-005
Fuse, Cartridge, 20A (F3)	1	600053-396-006
Alarm and Ballast Unit	1	628494-000-001 or 628496-000-001

9. REFERENCES

9.01 The engineering drawings listed in Table E were used in the preparation of this Section.

TABLE E

ENGINEERING DRAWINGS

TYPE	DRAWING NO.
Assembly	628490-000
Schematic	628490-002
Assembly	628494-000
Schematic	628494-002
Assembly	628496-000
Schematic	628496-002

9.02 Related information on the FADP may be found in Section ITTR-18-490, Fuse, Alarm and Distribution Panel (FADP), 628490 — Option Selection, Installation and Pretest.